

Enough: Staying Human in an Engineered Age
by Bill McKibben.

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Reviewed by David W. Gill www.ethixbiz.com

Bill McKibben writes regularly for the *New York Review of Books*, *The New York Times*, *The Atlantic*, and many other publications. Among his previous books are *The End of Nature* and *The Age of Missing Information*. McKibben's *Enough* is an impassioned call for debate on whether we should set limits on developments in human genetic engineering and advanced forms of robotics and nanotechnology. His belief is that these technologies "may alter our relationship not just with the rest of nature but with ourselves" and "call into question, often quite explicitly, our understanding of what it means to be a human being." (xii).

McKibben fends off the possible charge of impeding progress and playing the Luddite by saying such charges are "as silly as accusing someone of being a prohibitionist because he'd rather leave a barroom with a warm glow than a spinning head" (xii). Is it possible that our technological reach is now far enough? Can we limit ourselves? Should we do so?

McKibben is especially concerned about germline genetic engineering and cloning. So far this has not been successfully done on humans but recent progress on both plants and animals and the lack of public discussion is an ominous portent. Part of McKibben's concern is with the potential for unintended, dangerous, even macabre consequences. But the center of his argument is with the erosion of our humanity as we turn ourselves into technical objects, devices, engineered phenomena. Part of what it means to be human is to struggle against our limits; to transgress all limits by technological decisions would be to erase one of the essential features of our humanity.

Echoing Bill Joy's famous article, McKibben also argues that nanotechnology, miniaturization, self-replicating assemblers, and robotics are to inanimate matter what biotechnology is to animate matter. The two realms are threatening---and converging.

McKibben's answer is that we say "enough" and pronounce the world we live in "good." He quotes technophile futurist Lee Silver as saying we are on a "journey into a rapidly evolving future that no man, or woman, could stop" (p. 163). It is this arrogance and assumption of inevitability that McKibben challenges. McKibben gives examples of how various societies and groups have said "no" at various points. The Amish lifestyle, the European rejection of genetically modified food, the rejection of DDT, the resistance to nuclear power plants, some progress in controlling population growth . . . there are examples of a human capacity to resist what looks like inevitable scientific-technological prescriptions for our lives.

The scientists and their business investors are unlikely to be willing to stop on their own; a broader social debate is necessary. The answer is most certainly not to stop all scientific and technological advance; rather, it is to set some boundaries at critical points where our humanity is clearly at stake. McKibben's argument is well-written, provocative, and deserving of careful consideration.